TECHNOLOGY DEPT

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The AMERICAN HOROLOGIST

IN THE INTEREST OF THE HOROLOGICAL AND JEWELRY INDUSTRY

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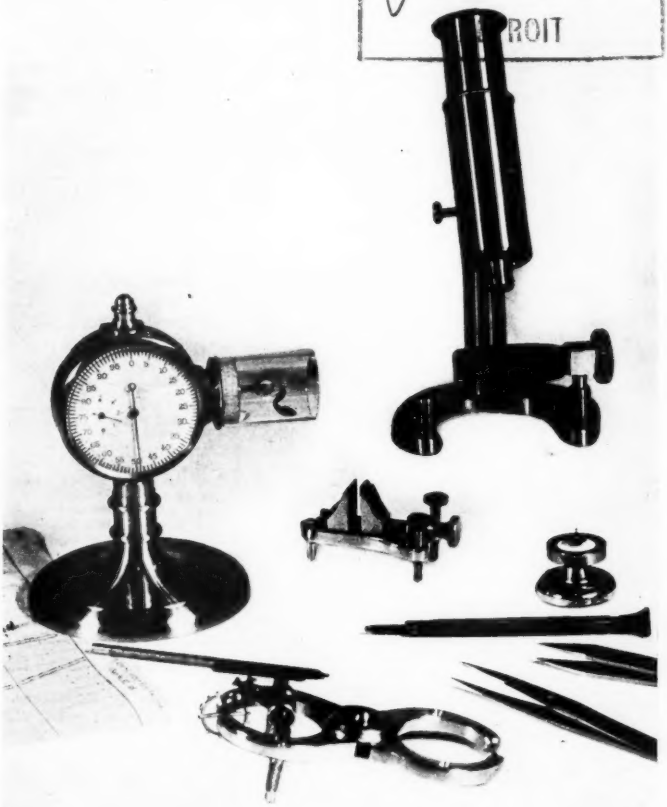

Vol. V JANUARY, 1940 No. 1

R v.5-6 1940-41

The AMERICAN HOROLOGIST

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THE AMERICAN HOROLOGIST

Published monthly by Roberts Publishing Company, Denver, Colorado, in the interest of Horological and Jewelry Industry. To inculcate the principles of Fraternal and Commercial Advancement; to promote the welfare and enhance the betterment of the industry; to cultivate good fellowship and a higher degree of knowledge in Horology and Jewelry Industry.

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PRICE

25c per copy, $2.00 per year in United States and Canada. $2.50 per year in all foreign countries. Members of U. H. A. A. receive the paper as part of their membership benefits.

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CHANGE OF ADDRESS

Change of address must be made prior to 5th of month to effect the forthcoming issue of the magazine. Both old and new addresses must be given.

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ADVERTISING RATES UPON REQUEST

Contributions and advertising material must be received not later than the 25th of the month preceding publication.

THE AMERICAN HOROLOGIST

Official National Publication of the United Horological Association of America, Inc., and all its affiliates, who operate as a united body toward the advancement and upliftment of the Horological and Jewelry Industry.

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Tech

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Swartchild Presents a METRIC BROACH-STOP DEVICE

No trying—no guessing—
Broach to Exact Metric Hole Size.

You can broach to exactly any desired hole size in watch hands, plates, cannon pinions, hour wheels, clock hands, etc., without having to guess when to stop broaching, by using this simple and accurate broach and file control outfit. Consists of 19 discs with holes graduating in size from .30 to 3.00 m/m. Sizes are plainly stamped, as illustrated and discs are on a steel ring from which they can be removed and replaced at will. Jewelers will also find this tool useful for SETTING STONES in rings, etc. as the discs control hole sizes exactly.

Eliminate the old trouble of having a hole turn out too big. With these new control discs you can broach or file any hole to exact metric size with a great saving in time heretofore lost by test-rebroach-and test-again methods.

How It Works

1. Use disc as a gauge to determine size of cannon pinion or hour wheel, etc.

2. Place disc that fits cannon pinion or hour wheel on broach, far as it will go, and open hole until disc stops you.

A perfect fit will result.

No. **R503914.** Swartchild's New Broach-stop Set _____ **95c**

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This February you can offer customers, for the first time, 15 jewel Elgin watches for only $24.75. They're the "America-First" models. Each is equipped with Elgin's exclusive Elginium hair-spring* and Beryl-X balance—rustproof, non-magnetic, unaffected by temperature changes. A special, strong advertising campaign will stimulate your February sales of these and other Elgins. So stock up now!

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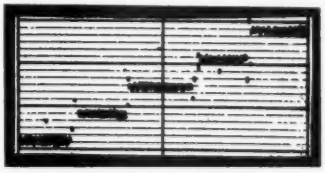
Equalizing Escapewheel Teeth

IN USING the new timing machines we often find the following condition existing, which to many watchmakers cause much annoyance, but which we hope to aid you in overcoming.

Defective Escape Tooth

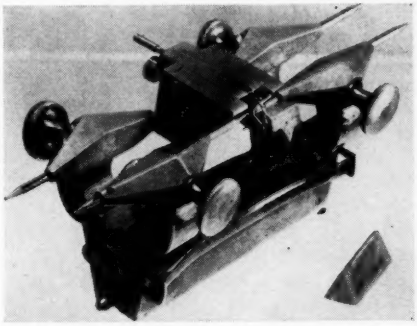
The five cycle characteristic of this record indicates faulty action of the escape wheel. The short sections of regularly spaced dots represent the period in which the escape wheel locks accurately with the pallets and the several scattered dots show that the escape action is irregular once each revolution of the escape wheel



(fifteen tooth wheel). During this irregular period the rate advances rapidly.

Rate—Although it is not of practical importance to accurately read the rate of this type record, it may be of interest to note that the example shown represents a gaining rate of 80 seconds per day.

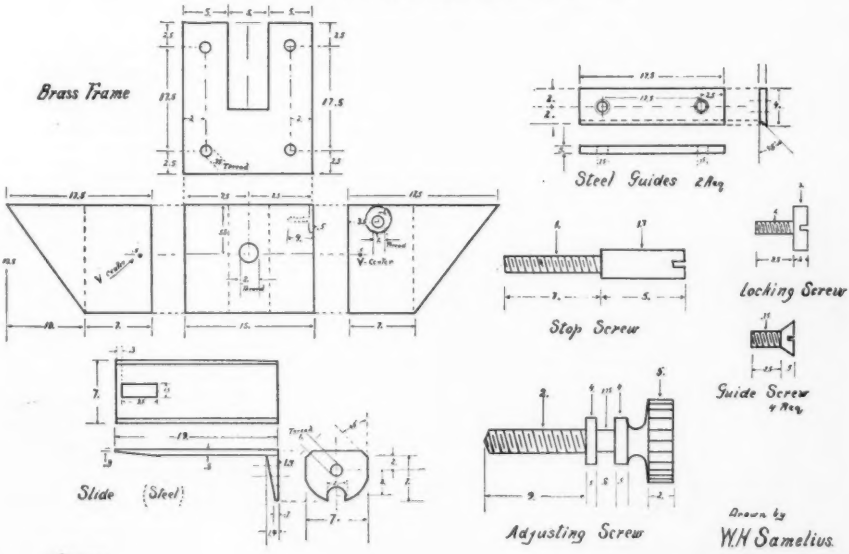
Action—The periodic irregularities are due mainly to improper locking of the escape wheel which may be caused by missing of the pallet by one of the teeth.



It may be bent, worn, or otherwise defective.

This method of equalizing escape-

ESCAPE WHEEL EQUALIZING TOOL.



wheel teeth is a practical method in which each tooth is re-faced in the simple tool illustrated.

The tool can be made by any bench man and consists of a brass or steel block with an adjustable steel table, preferably case hardened, or the attachment can be purchased from designer on order.

By placing the tool in your depthing tool the elevation and angle can be secured by the depthing tool screw and the adjustable slide of equalizer tool.

You first determine the short tooth, resting the heel of tooth against the slide, when short or worn tooth is located make adjustment so as to not change the toe end of tooth.

You will find a short oil stone best adapted for this work of re-facing. If desired you may use steel burnisher to finish; in some cases the steel burnisher is sufficient to rectify error.

Such a process with a little practice will be found very satisfactory and will leave a smoother finish than left by cutters.

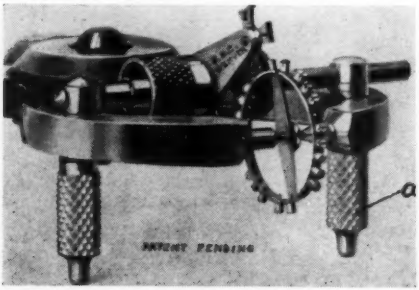
Understand this is a practical method and preliminary practice should be had before attempting to change a wheel in a customer's watch.

J. A. Purvis Co.

Wholesale watch materials are now located in the Peachtree Arcade Building, Atlanta, Ga.

Cover Page

Adjusting a pleasure with proper tools.



Attachment for Trueing Calipers, Making Your Work More Pleasurable.

From Every Officer, U. H. A. A. Affiliates

If the world about you seems dark and grim, are you going to sit idly by and give in?

If business is poor and cash comes slow, are you going to quit because it's so?

If competition is keen and the road is congested, are you going to sit by and try to digest it?

Or are you a man who will not accept these commonplace troubles? One, who like thousands of real men, will consider them bubbles.

A man among men who shuns not his trade fellows. A man that despite his personal dislikes towards others will meet in trade groups and learn to know his trade brothers.

A man who will reason, plan and then act, when he finds that his trade brothers are on the right track.

We feel you can help us as we can help you, and by getting together will determine what to do.

We know you are willing and will do your share, when enlightened on the problems which need our care.

So despite how you feel about certain issues, we plan on your presence, and if absent, will miss you.

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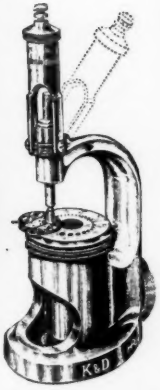
Nos. 18X54 AND 18X55

Showing Attachment furnished with No. 18X54

Cut shows Complete Inverto DeLuxe
Nos. 18X54 and 18X55 contain only items A to E listed below.



Showing Attachment furnished with No. 18X55

For the Jeweler who wishes to complete his K. & D. Staking Tool—Inverto, No. 16B, No. 12B or No. 510 to No. 517 so it can be used for Friction Jeweling, we recommend EITHER of the following:

COMBINATION No. 18X54

A.—Friction Jeweling Attachment No. 540.

B.—DeLuxe Staking Tool Box.

C.—No. 321—Set of 7 Friction Jeweling Sub-Punches and Holder.

D.—No. 322B—Set of 18 Friction Jeweling Reamers with sizes from No. 6 to No. 30 stamped on each Reamer—including Reamer Holder.

E.—No. 324—Set of 6 graduated Flat Face Hollow Stumps.

Price: $21.00

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A.—Friction Jeweling Attachment No. 550.

B.—DeLuxe Staking Tool Box.

C.—No. 321—Set of 7 Friction Jeweling Sub-Punches and Holder.

D.—No. 322B—Set of 18 Friction Jeweling Reamers with sizes from No. 6 to No. 30 stamped on each Reamer—including Reamer Holder.

E.—No. 324—Set of 6 graduated Flat Face Hollow Stumps.

Price: $21.00

The Attachments for Friction Jeweling are NOT ADAPTABLE to the small K. & D. Staking Tool Frames No. 501, No. 5B, No. 504 and No. 507.

If you already have one of the above Friction Jeweling Attachments and require ONLY the large DeLuxe Staking Tool Box it can be supplied at the SPECIAL PRICE OF $10.50.

ORDER THROUGH YOUR JOBBER

HAMMEL, RIGLANDER & CO., INC.

NEW YORK CITY, Exclusive Wholesale Distributors NEW YORK

Ultra-Complicated Watch

Submitted by GEO. T. GRUEN

Made by L. Leroy & Cie., Horologists to the French Navy, Paris, France.

THIS unique watch, believed to be one of the most complicated ever constructed, was started November 1, 1897, and completely finished November 15, 1904. The watch was made according to the specifications given by its eventual owner, a Portuguese count.

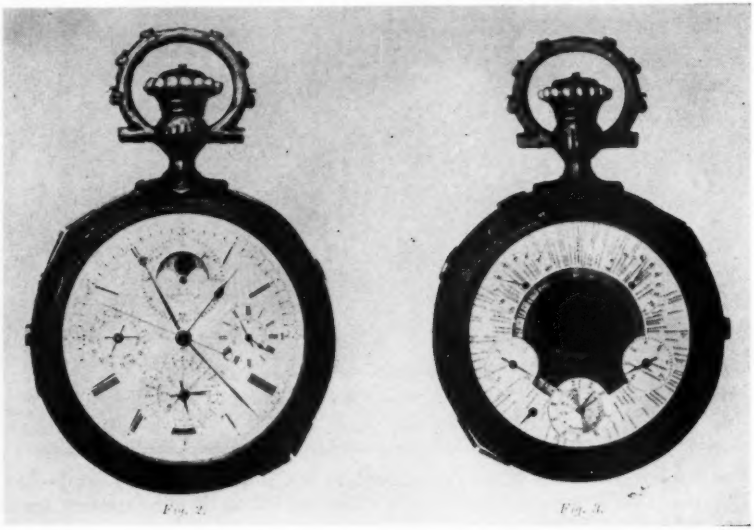

Fig. 2—Front View of Watch.

Fig 3—Rear View of Watch.

Some of the various dimensions of this watch are:

The exterior diameter of the case is 71 m/m. and is made of 18-karat gold, weighing 228 grammes (without springs, buttons, etc.). The diameter of the movement is 52.3 m/m. The height of the movement is 17.5 m/m.

In addition to being a very accurate timepiece, the watch has the following additional operations or functions:

1. Calendar of days of week.
2. Calendar of days of month.
3. Perpetual calendar of months and leap years.
4. The yearly date (like 1939).
5. The phases and duration of the moon.
6. The seasons, solstices, equinoxes.
7. The equation of time.
8. Split-second chronograph with mechanisms for returning to zero.
9. Minute recorder with mechanisms for returning to zero.
10. Hour recorder with mechanisms for returning to zero.
11. Winding indicator.
12. Large and small chimes.
13. The striking of hours, quarter-hours and minutes, with a silent gearing on three bells, giving a carillon effect.
14. The status of the firmament in the boreal hemisphere, with a sky and horizon for Paris showing 236 stars and for Lisbon, 560 stars.

(Concluded on Page 10)

Incomparable
Watch Case Repairing
OUR WORK COSTS NO MORE THAN ORDINARY WORK
BECKER-HECKMAN CO.
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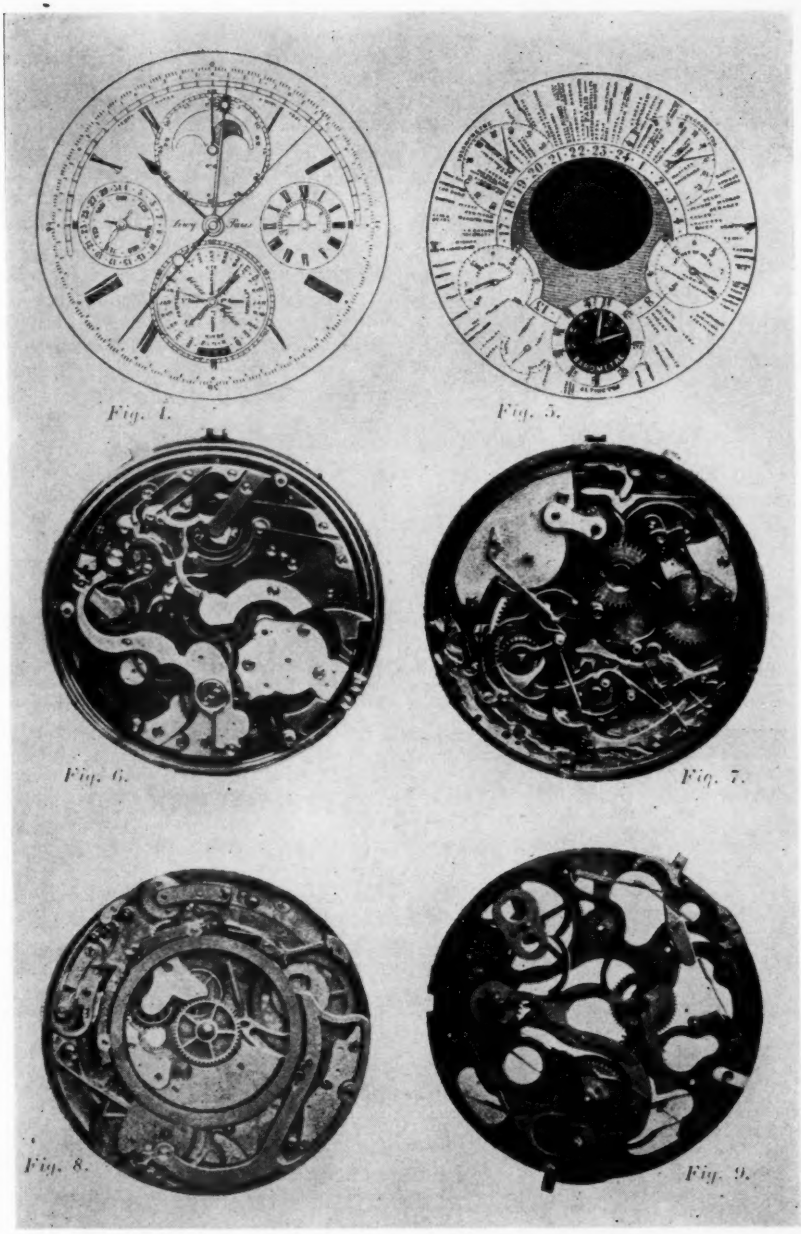


Fig. 4—Front Dial. Fig. 5—Rear Dial. Fig. 6—View showing the Mechanisms for Winding, Special Regulating, Chronograph, Hour and Minute Indicators, Hammers and Chime Bell Springs. Fig. 7—View Showing Mechanisms for the Large Chimes, Hour, Quarter-hour and Minute Repeaters, and Winding Indicator. Fig. 8—View of Extra Plate or Bridge Showing the Mechanisms Giving the Position of the Constellations at Paris, the Time of Sunrise and Sunset at Lisbon, Thermometer, hygrometer, Longitudes, etc. Fig. 9—View of Second Extra Plate Showing Mechanisms for the Perpetual Calendars, Giving Day, Month, Year and Leap Year, Phases of the Moon, and Equation of Time.

15. The status of the firmament in the austral hemisphere, with a sky and horizon for Rio de Janeiro showing 611 stars.
16. The time in 125 cities of the world.
17. The hour of sunrise in Lisbon.
18. The hour of sunset in Lisbon.
19. A metallic centigrade thermometer.
20. A hygrometer (to determine humidity).
21. A barometer.
22. An altimeter up to 5000 meters.
23. A special mechanism attached to the regulator which permits regulating the watch without opening the case.
24. A compass.
25. The case has the 12 signs of the Zodiac.

Fusee

By W. H. Samelius

A spirally grooved pulley intermediately placed between the mainspring drum and the center pinion of a watch or clock for the purpose of converting the varying strength of the spring into a constant pressure at the center pinion.

The fusee was invented by Jacob Zech of Prague about 1525 and all of our earliest watches were equipped with a fusee. The connection between the fusee and drum was obtained by means of a gut cord and in later years, a flexible steel chain was employed.

It was not until 1665 when John Harrison of England invented the maintaining power, sometimes known as the going fusee. This is one of the most outstanding contributions to horology. By means of maintaining power the watch or clock may be wound without taking power from the train, allowing the balance or pendulum to keep in motion as the watch or clock is being wound. Today all chronometers with a fusee, or fine weight-driven clocks, are fitted with John Harrison's improvement; namely, maintaining power.

The writer recently came into possession of an English mantle clock fitted with a fusee, something rarely to be found

Announcing:

The New 7th Edition (1940)

Newall Finger Print Catalog

is ready for distribution.

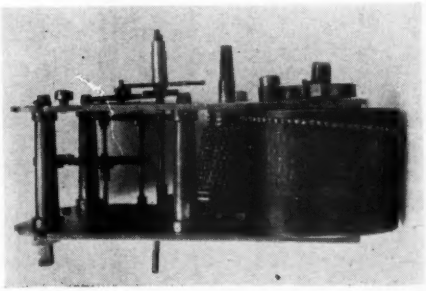
Write Your Material
Jobber for Your Copy.

The Newall Mfg. Co.

CHICAGO, ILL.

in this country. This particular clock was made by Lee & Co., 71 Bull St., Birmingham, England, and possibly dates back 150 years.

The plates are of heavy brass, 4x6 inches, having heavy pillars or spacers. The dial is made of heavy iron plate, 10 inches in diameter, with pillars permanently fastened to the dial so the movement is attached to the dial and the dial is fastened in the case, the dial carrying all the weight.



The mainspring drum is quite large, being 61 mm. diameter and 60 mm. wide, accommodating a very long thin mainspring. The fusee or main wheel is 56 mm. in diameter and has 96 teeth. This particular clock was not fitted with maintaining power. Like all fusee watches, it has a stop works, permitting 16 turns of power and preventing the chain from coming off the drum.

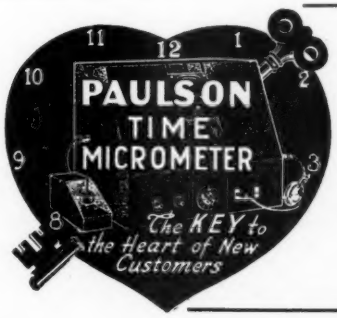
The centerwheel has 84 teeth and is 49 mm. diameter with an 8-leaf pinion. The third wheel has 77 teeth, 45 mm. in diameter, and has a 7-leaf pinion. The escape wheel has 32 teeth, 41 mm. in diameter, with a 7-leaf pinion. The pallet is of the recoil type. The pendulum is 6½ inches long and the chain is 4½ feet long. The accompanying photograph shows the elevation of the clock.

New Broach-Stop Device a Very Useful Tool

Enlarging a hole with a broach or file is one of the every-day common tasks of the watchmaker and jeweler. The usual procedure is to broach, test, broach again, test again, until the hole is the correct size—the trick being not to get it too large, which of course often happens.

The New Broach-Stop Device, originated by Swartchild & Co., consists of a simple, inexpensive set of accurate gauges with holes graduating in size from .30 to 3.00 m/m. The gauges are first used to determine the size of cannon pinion, hour wheel, etc. The one that fits is then placed on the broach or file and the hole is opened up in the usual manner, except that the disc or gauge stops the operation at the exact metric hole size desired.

This broach-stop device is useful in broaching to exact metric hole size in watch hands, plates, cannon pinions, hour wheels, clock hands, etc., without having to guess when to stop broaching. Also useful for setting stones in rings, etc., as the discs control hole sizes exactly. The complete set of 19 may be obtained from Swartchild & Co. See the illustration on page three.



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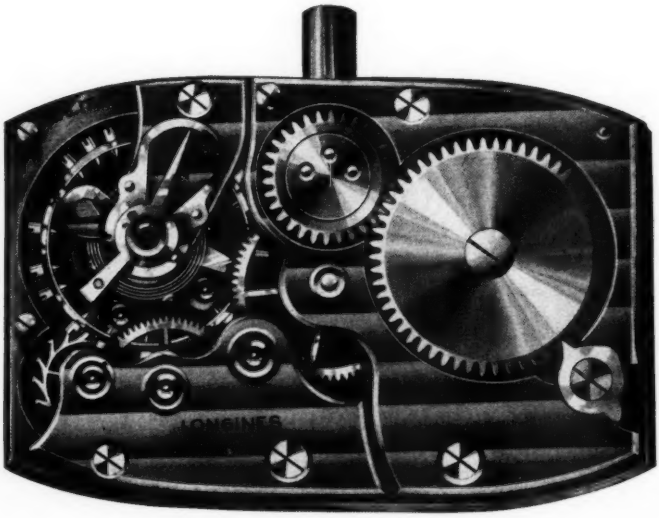
AND THOUSANDS ARE USING THEM

The Paulson Time Micrometer, now in its fifth year of successful performance in thousands of retail jewelry stores, not only quickly locates the trouble in the watch, speeds up your repairs at least 25% but of greater importance, it creates more business for you, builds prestige and dependability as hundreds of laudatory letters will testify. **You take no chances, satisfaction guaranteed.**

HENRY PAULSON & CO.
EXCLUSIVE DISTRIBUTOR CHICAGO

Below is a section of an advertisement published in "National Aeronautics" and other magazines. It contains facts of interest to every jeweler.



WE, TOO, MAKE 'MOTORS'

ABOVE is a simple Longine "motor"—from a standard wristwatch shown enlarged 6 times. Its 192 parts weigh together 5 pennyweights or 1/4 of an ounce and a few milligrams of oil held in 17 oil retaining jewel bearings are sufficient for 8 months of continuous running. (When did you last have an oil-job done on your watch?) Each one of the 192 parts are interchangeable with like parts in any like movement. It will give years of trouble-free service with reasonable care.

The dependability and accuracy of Longines watches is the product of scientific design, plus special machinery conceived and constructed in the Longines factory, plus Longines-trained watchmakers and technicians. The fine reputation of Longines watches has been earned by constant adherence to the highest standards for more than 73 years. Longines watches are a product of the Longines-Wittnauer Watch Co., 580 Fifth Ave., New York, N. Y.

10 WORLD'S FAIR GRAND PRIZES 28 GOLD MEDALS

Longines

MORE HONORS FOR ACCURACY THAN ANY OTHER WATCH

THE WORLD'S MOST HONORED WATCH

"The Early American Clock"

By J. E. COLEMAN

ARTICLE No. 2

IN OUR first of this series of articles appearing in the October issue we promised something practical, something that would interest the repairman, the owner and antique dealer, but, the practical side of the Early American Clock can not be reached in one jump because that era of individual effort extending from the earlier colonial times down to about 1800 must be touched upon before we arrive at the clocks we are accustomed to usually seeing in the homes of friends, in repair shops and on dealers' floors, since but very few clocks are to be seen outside of museums that were made prior to the year 1800.

Prof. Willis I. Milham in his splendid book, "Time and Timekeepers," says: "There are three distinct periods in the history of clockmaking in America. The first extends from the earliest colonial times to about 1800. It was the era of individual effort. Each clockmaker made but a few clocks, entirely with hand tools, and they were usually not exactly alike. The second period extends from 1800 to almost 1860. Machine methods made their appearance and numerous clock factories came into existence. The number of different clocks made during this period was extremely small, there were not many more than half a dozen varieties. The third period is the modern period and extends from 1860 to the present day. Its three great characteristics are (1) use of factory methods only. (2) Small number of clock factories, but most of them large ones, and (3) an enormous variety in the output."

Up to the year 1700, history has recorded only two clockmakers for the Colonies, the first to arrive was William Davis, who landed in Boston in 1683. Immigration regulations must have been very much like those in force today, since Mr. Davis had to get someone to go his surety that he and his family would not become dependent upon the town. It was this statistical record that caused Davis' arrival to be accurately recorded, otherwise there might have been some question of the year of his coming to America. The next Colonial maker of timepieces was Evardus Bogardus of New York who was actively at work in 1698. Bogardus was the son of a Dutch Reform minister, it is generally thought that he was born in the Colonies and was sent back to Holland for his education and to learn a trade.

From 1700 to 1750, there is recorded twenty-two clockmakers for the Colonies, many of them wrought lasting names for themselves; several in other lines as well as clockmaking. The earlier accounts of clockmaking in Connecticut mentions that Ebenezer Parmelee, "a skillful mechanic," built and gave to the Ecclesiastical Society of Guilford, a clock for the town meeting house. It was finished and installed in 1726. Parmelee kept it in order for many years and by reason of his attention to the town's official timekeeper he was relieved, in 1741, from holding any town office so long as he continued to assume that responsibility to its citizens. In 1740, Parmelee made a clock with brass works for the town meeting house of New Haven. A. B. Sands in "Timepieces of Old and New Connecticut" relates that: "With true Yankee caution the town officials (New Haven) tried out the clock for two years before deciding it was satisfactory and paying for it." This same Yankee shrewdness was to follow this clock throughout the years, for almost a hundred years later Barzillia Davidson contracted to replace it with a new clock for $300—he allowed $40 for the old (brass) Parmelee movement and received $260 in cash for his new wooden movement, he repaired the brass movement taken in in trade and later set it up in New York for $600. In most lists of American clockmakers, Parmelee is dated from 1726 to 1740, these years are evidently taken from the installation of Guilford and New Haven clocks, however, it stands to reason that he must have been actively engaged in clockmaking long enough to build up a

reputation or else he would not have been afforded the opportunity of contracting for the Guilford clock. On the other hand we find him still caring for it in 1741 when he was relieved of other civic duties. Therefore, further research is bound to extend his activities both before 1726 and after 1740.

While Parmelee was installing the Guilford clock, a clockmaker in Boston, Avery by name, was making the historic clock that later set Paul Revere off on his famous midnight ride. It is said that this clock still hangs in the Old North Church.

At about this same time another name to become prominent in early American clockmaking enters the scene. The Cheney family, Benjamin and Timothy Cheney, brothers, are listed at East Hartford (now Manchester), Connecticut, 1745 to 1780. They produced tall or grandfather clocks with wooden movements and excellent carved cherry cases and were rated as the best workmen of their times. John Fitch, inventor of the steamboat was an apprentice in their shop. The Cheney name was carried forward by Elisha, a son of Benjamin who had shops in Middleton and Berlin, Conn., 1800 to 1835. His son Olcott, who had previously worked with his father, bought the shop in 1835 and carried on the business for a number of years. Russel Cheney, another son of Benjamin, also learned the trade of clockmaker and became a very skillful workman but did not remain in the business very long. Since it is so popular to attribute the wooden movement clock to Eli Terry, about the year 1797, it is interesting to note that the Cheneys were making and selling them as early as about 1745. Another popular fallacy in this same connection is that "wooden" clocks originated in Connecticut. The first clock built by the famous chronometer-maker, John (Longitude) Harrison at Barrow, Eng., in 1715 was a wooden one. It is described as a tall eight-day clock; the frame, wheels and pinions being of solid oak. It is generally accepted that wooden movement clocks were made long before this date.

(To Be Continued)

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Thinnest and Smallest round watch for women ever made in America!

The Thinnest American wrist watch of its size ever made for men!

WALTHAM PREMIER Watches are factory cased and timed

THE FIRST AMERICAN WATCHMAKER **WALTHAM**

Rhode Island Horological Association

Rhode Island has been exceedingly active during the past several months. Their meetings have varied from the somber side of technical lectures to the delivery of fine orations by Major Hamilton on antique clocks and watches, the song and dance motion pictures, and virtually every phase of entertainment that could be thought of.

LEO ABISCH, State President

Progress in this state is truly noticeable; and one thing in particular which has proven to be of great advantage to the organization and those participating is the cooperative advertising; and we call your attention to the reproduction of their advertising as used December 3, 1939.

The latter part of December a large Christmas party is being planned by the organization to celebrate the closing of the 1939 year and to reflect the good which has come in the trade in general through the influence of their association.

Rhode Island Association

Continues their cooperative advertising campaign, which has proved to be exceedingly successful. Those who participated in the accompanying ad reported wonderful returns and mention of their ad in the paper. Other organizations should take equal interest and profit through the experience of others in such dignified advertising.

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The duplication, repair or refinishing our specialty Estimates cheerfully given.

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W. M. HOUSTON
WATCHMAKER
44 Washington St.

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Theodore E. Vaine
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Complete Line of Waltham & Elgin Watches

F. Nicarelli
WATCHMAKER
Fine Watch Repairing
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"Clean Watch

WITH THE PEERLESS AUTOMATIC REVER

(BASKET REVERSES ROTATION EVERY 5 SEC

WATCH CLEANING MACH

The Only Practical Way of Cleaning Movements THOROUGHLY and QUICKL

The Peerless "Automatic Reversing" Watch Cleaning Machine is the only machine that assures its user of a continuous flow of solution around watch parts in the basket; it eliminates, by its "Automatic Reversing" feature, air pockets that are bound to develop in any cleaning machine where the basket rotates in one direction continuously. The Peerless basket, rotating to the right for five seconds, then automatically reversing and rotating to the left for the next five, breaks up all the air pockets that might form.

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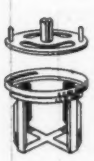

Basket is composed of three separate Monel metal wire screen sections (partitioned for different sizes of watch parts) fitting on top of each other and all into a skeleton frame. Definitely the finest added feature as the solution passes through only one layer of wire screen rather than three or four where the sections fit into one another. The skeleton frame is constructed with eight louvres or fins which, when basket rotates, form a suction that draws the solution through every section of the basket.

Outstanding Features:

- **NEW CONTROL SWITCH** which allows you to sh "Automatic Reversing" should you at any time the need of working without it.
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- **DRIER CONTROLLED BY AUTOMATIC TIME SW** Calibrated in ½ minute, when fully turned on ates for 2 minutes then automatically turns off. gradually—no overheating of parts.
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OF SOLUTION AND
in front. Locks into

to regulate speed of

Y LOCATED ON BASE

works in conjunction
n operation.

Chromium trim.

aner. 2—1st Rinse.
5—Electric Drier.

MATIC TIME SWITCH
fully turned on oper-
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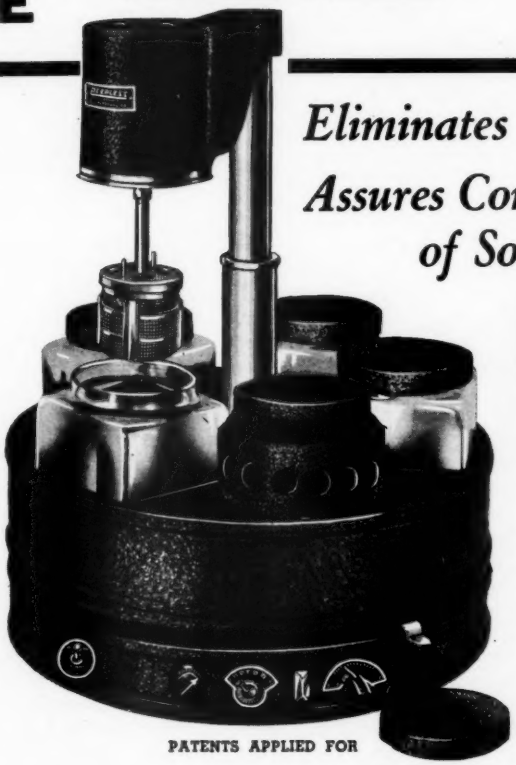

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AERONAUTICAL INSTRUMENT SERVICE

Aircraft Instruments

EDITOR'S NOTE—Aeronautical Instrument Service is a subject untouched by publications in the Horological field, or in fact by any publication. In September, 1938, THE AMERICAN HOROLOGIST inaugurated such an educational service via prepared illustrated lectures to be used by U. H. A. A. organizations for the purpose of broadening our members' scope of knowledge in this field, which offered additional remuneration to those far-sighted enough to avail themselves of such knowledge.

ARTICLE No. 4

(Continued from December Issue)

Thermometers. — Aircraft-engine thermometers are provided for the purpose of indicating to the pilot the temperature of the cooling water, the oil, or of the cylinder walls or head. The instruments are of the distant-reading types, thus enabling the indicator to be located at a point, such as on the instrument board, which is distant from the temperature source. The aircraft-engine thermometer serves the following principal uses:

Warns of overheating of engine.

Assists in operating the engine at the temperature of maximum efficiency.

Indicates when the cooling water is at or near its boiling point.

Warns against allowing the engine becoming too cold during a glide.

Indicates when the oil is warm enough to allow a safe take-off.

Possibly warns that the cooling water is in danger of freezing.

As a general rule a water-cooled engine should be operated so that the temperature of the cooling water remains about 10° to 30° C. below the boiling point. If the temperature can not be kept within this range during normal operation, it is an indication that something is wrong. In this connection it should be remembered that the boiling point of the cooling water varies with altitude. Thus at sea level water boils at 100° C. while at 20,000-foot altitude the boiling point is only 83° C. For the convenience of the pilot, aircraft thermometers are provided with an auxiliary scale showing the boiling points of water for altitudes from 0 to 30,000 feet.

There are two general classes of distant-reading thermometers used for aircraft engines, viz, pressure and electric. The pressure types have in the past been the most common, they being best adapted to the measurement of water and oil temperatures. The electric types will probably be mostly used to determine the cylinder temperature of the air-cooled engine.

Pressure thermometers.—Pressure thermometers consist of a bulb connected to a suitable pressure gauge by means of a capillary.

Capillary.—The capillary is a length of plain drawn copper tubing the internal diameter of which is very small, measuring from about 0.014 inch to about 0.020 inch. If the outside diameter is less than about 0.1 inch, the tubing is usually protected by a flexible metallic braided casing. This combination makes a more flexible capillary which is easier to install, and which will stand more bends than the unprotected tubing of larger outside diameter. On the other hand, the flexible braided type is more subject to kinking, which causes failure due to breakage or stoppage. Apparently it is also more liable to breakage caused by vibration at the point where it enters the bulb or gauge. This latter can be materially helped by preventing the localization of the bending stress at the point where the tubing enters the bulb or gauge as shown in Figure 12. The taping of the capillary to the water line at the end of the reinforcement causes that portion of the capillary within the reinforcement to vibrate with the water line, thus moving the point of bending stress away from the bulb to the entire length of capillary tubing held beneath the tape. Thermometers should

be selected with capillaries of proper length for the particular installation if possible. The capillary should never be pulled tight between any two parts of members which can move or vibrate with respect to each other, as this induces breakage. Excess capillary should be rolled into a neat coil and taped securely to a rigid member. An excess of capillary is to be avoided since it is a source of additional error in the indication. The entire length of capillary should be supported by frequent taping to convenient members between the indicator and bulb. It should not be supported upon or in the immediate vicinity of members whose temperature will vary much from that of the indicator since another additional error is likely to be introduced thereby. The capillary should be protected against abrasion where it passes through holes or near some member by rubber grommets or by taping. Sharp bends and kinks are to be avoided.

The most frequent cause of failure of pressure thermometers is capillary breakage, caused by kinking or by crystallization due to vibration. The latter usually occurs at the bulb and sometimes at the indicator. Capillary breakage is evidenced by a rapid drop of the gauge pointer to zero.

Bulb.—The bulb is designed to be located in a well where it will be in direct contact with the water or oil whose temperature is to be determined. The bulb of the cooling water thermometer is generally placed in the top of the engine or in the line to the radiator in order that the highest temperature will be indicated. The oil thermometer bulb is placed in a well provided in the engine, or in the line to the engine, in order that the temperature of the oil entering the engine will be indicated. This bulb contains a liquid whose change in volume or vapor pressure with temperature is transmitted through the capillary to operate the gauge.

Gauges.—Two distinct types of gauges have been used, one employing an ordinary Bourdon tube with sector and pinion multiplying mechanism; the other, a long Bourdon tube of many turns which is connected through a bimetallic temperature compensator to the pointer. These gauge mechanisms are fully described later. Either type of gauge can be used for either type of pressure thermometer. The ordinary Bourdon gauge, however, has been used up to the present for vapor-pressure instruments only, while the multiple-turn Bourdon tube has been used for liquid-filled instruments. Figure 10 shows the

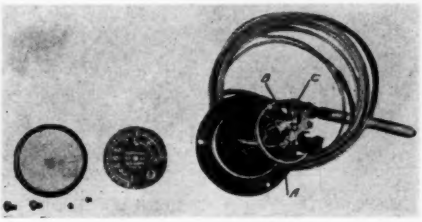

Figure 10.—Interior Construction of Vapor Pressure Type Thermometer

interior construction of the vapor-pressure type with Bourdon spring tube *A*, sector *B*, and pointer *C*. Figure 11 shows the interior construction of the liquid-filled instrument. The interior coil *A*, to which the pointer is connected, is the bimetallic compensator. The outer coil *B* is the Bourdon tube.

Vapor-pressure type. — Principle. The action of the vapor-pressure thermometer depends upon the fact that pressure inside the thermometer is determined solely by the temperature of the free surface of the liquid. It follows that the thermometer must be so constructed that one free surface (dividing line between liquid and gas) is always in the bulb. If this condition is fulfilled, the readings of the instrument will not be sensibly affected by changes in the temperature of the gauge and capillary. It must be remembered, however, that the liquid will always accumulate in the cooler parts if possible;

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that is, if these parts are not already filled with liquid (or with noncondensable gas). The two extreme cases to be considered, therefore, are: First, when the bulb is the hottest part of the system; second, when the bulb is the coldest part of the system.

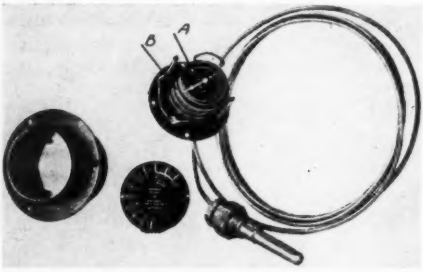

Figure 11.—Interior Construction of Liquid Filled Type Thermometer.

The former is the more important and more usual condition. Assuming that the thermometer contains no air, the gauge and capillary will fill with liquid; and there must still be liquid in the bulb if the thermometer is to indicate properly. It follows that *the volume of liquid must be greater than that of the gauge and capillary combined.* An interesting variation of this case is that in which the volume of liquid is barely sufficient when gauge and capillary are at room temperature. Then, when they are cooled, the liquid in the system contracts to such an extent that it is insufficient to fill them. The thermometer, under such conditions, indicates properly when the parts other than the bulb are at room temperature, but fails when they are cooled.

The second condition, in which the bulb is coldest, may occur occasionally. In this case, the liquid goes to the bulb. But if the volume of liquid is more than sufficient to fill the bulb, the free surface will be in the capillary, and the thermometer will fail to indicate properly.

A less extreme case is that in which the capillary or a part of the capillary alone is heated to a higher temperature than either bulb or gauge. When this occurs, the gauge, if it is colder than the bulb, will be filled with liquid. The remaining liquid will be in the bulb unless the volume of the liquid is so large as to fill part of the capillary also.

A thermometer containing more than enough liquid to fill the bulb will fail on a simple test: Namely, when the bulb is put in ice, the instrument will indicate the temperature of either the capillary or the gauge. It is evident that *the volume of the liquid should be insufficient to fill the bulb at any temperature; that the combined volumes of the capillary and gauge must be less than that of the bulb;* and that if a relatively small bulb is required, the capillary must be very fine in order that the last-named condition may be fulfilled.

The problem of obtaining proper volume relations may be simplified by the use of a transmitting liquid in the tubing and the gauge. Such a liquid must have a high boiling point, a low freezing point, be noncorrosive, and must neither react nor mix with volatile liquid. If a liquid of this kind is used, the effective volume of the gauge and capillary is reduced to nearly zero, and the necessary volume of the bulb and quantity of the volatile liquid are greatly reduced.

The transmitting-liquid type of thermometer has not come into use in this country, although some experimental instruments have been made. The trans-

TABLE I.—*Liquids for vapor-pressure thermometers*

Liquids	Sea Level boiling point (degree)	Vapor pressures (pounds per square inch absolute)		Error in indication at 19,000 feet altitude for bulb temperature	
		At 0° C.	At 100° C.	0° C.	80° C.
Methyl chloride	—23.7	36.5	462.0	5.0	(1)
Sulphur dioxide	—10.0	22.5	408.0	7.0	1.3
Methyl ether	—34.0	36.3	459.0	6.0	1.0
Ammonia	—33.5	61.5	902.0	2.5	.5

[1] Less than 1.

mitting liquid is a solution consisting of six parts of glycerine to four parts water, the volatile liquid being methyl chloride.

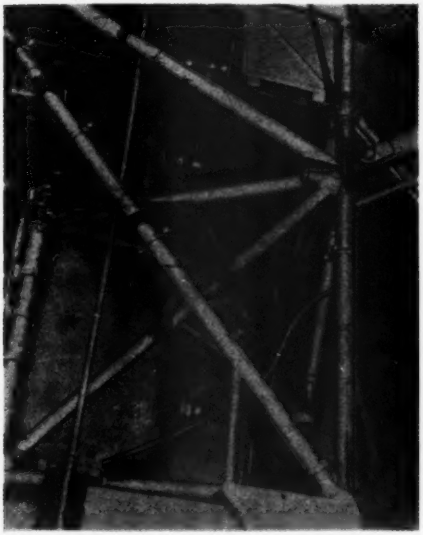

Figure 12.—Installation of pressure Thermometer Bulb.

Volatile liquids. — Methyl chloride is used as the volatile liquid in the majority of the vapor-pressure thermometers in use at present on American aircraft. A brief consideration of some of the liquids that could be used may be of interest. The following table gives the properties of some liquids which can be used in a vapor-pressure thermometer for an aircraft engine; and for each liquid, the reading in degrees centigrade of a thermometer at an altiude of approximately 19,000 feet (one-half atmospheric pressure).

The volatile liquid used must be stable, obtained and purified readily, must not act on the metals with which it comes in contact, must have a sufficiently low freezing point, and a critical temperature above 100° C. The table shows that variations in external atmospheric pressure occurring at different altitudes cause smaller variations in the indications of thermometers filled with liquids having lower boiling points and, consequently, higher vapor pressures in the working temperature range. The high-pressure gauges used with these liquids are also sturdier than low-pressure gauges. Ammonia, although listed in the table, has not been used, because it would require a steel container. Methyl chloride, methyl ether, and sulphur dioxide fulfill the requirements very satisfactorily. However, methyl chloride-filled thermometers are the only thermometers of the vapor-pressure type being produced in quantity for aircraft use at the present time.

Liquid-filled type, Principle of.—The liquid expansion or liquid-filled thermometer utilizes the thermal expansion of some liquid, usually alcohol or xylene. Xylene-filled thermometers can not be used where air temperatures of —40° C. or lower will be encountered because of the freezing at this temperature of the present commercial grade of xylene used. The thermal expansion for the liquids used is nearly linear with respect to temperature in the range of 0° to 100° C. These instruments are made to have an

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internal pressure at 0° of about 100 pounds per square inch, the pressure increasing to 700 or 800 pounds at 100° C. Such a large pressure range permits the use of a rugged gauge mechanism and makes the indications of the instrument nearly independent of variation in atmospheric pressure. Since the capillary and Bourdon tube of liquid-filled thermometers as well as the bulb are completely filled with the actuating liquid, any change in temperature of the capillary or of the indicator (in which the Bourdon tube is located) causes a corresponding change in the indication. This effect, of course, is not desirable, and to minimize it the volume of the bulb is made large in comparison to the sum of the volumes of the capillary and Bourdon tube. This explains the use of a capillary with a small internal diameter. However, the temperature change effect of the Bourdon tube and capillary can not be minimized sufficiently to care for the great extremes of temperature to which they are exposed in use on aircraft and in addition some form of compensation must be employed.

Compensating coil for. — A bimetallic compensating helical coil is employed in the instruments now in use. This coil is connected at one end to the pointer spindle and at the other end to the Bourdon tube. It is either designed to compensate for changes in the temperature of the gauge alone or to approximately compensate for changes of the gauge and capillary together.

Repair and calibration of pressure thermometers. — Loose pointers and broken or damaged capillaries are the usual causes of failure in pressure thermometers. The first can easily be repaired by resetting the pointer. In case of a damaged capillary, the instrument must be returned to the manufacturer for repairs.

The apparatus necessary for testing aircraft pressure thermometers consists of—

A reliable mercury-in-glass thermometer having a range of 0° to 115° C., which should be kept as standard.

A container in which water may be heated.

The procedure for testing is as follows:

Fill the container with pure water.

Submerge the bulb of the radiator thermometer, but do not allow any of the capillary tubing to be in the water.

So place the indicator head that it may be read easily, but that neither it nor the capillary tubing is overheated by the source used for heating the water.

Immerse the standard thermometer in the water up to the point of specified immersion.

Heat the water gradually, stir it continuously to insure a uniform temperature, and take readings every 10°.

In calibrating under the above conditions, the error at any point should not be greater than 3° for any type. If the standard thermometer has any errors, the necessary corrections should be applied before the errors of the instrument being calibrated are computed.

(Continued in Next Issue)

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Practical Problem in Adjusting

By GEORGE J. SCHLEHR,
U. H. A. A. Technical Board

Note: This problem in practical position adjusting was conducted and carried to completion by a student (Clifford Johnson) of the Horological Department at the New York State School of Agriculture, Morrisville, New York, under the direction and guidance of George J. Schlehr, Instructor of Horology and member of U. H. A. of A. Science of Horology and Technical Advisory Board.

Waltham 16', 17-Jewel, Single Roller, Open Face No. 16761035

The movement was thoroughly cleaned, balance pivots polished, assembled and run through 24-hour period in each of the six positions. The position rates were as follows:

	Progressive Rate	Position Rate
Dial Up	—13 sec.	—13 sec.
Dial Down	—27 sec.	—14 sec.
12 Up	+11 sec.	+38 sec.
9 Up	—40 sec.	—51 sec.
3 Up	—53 sec.	—13 sec.
6 Up	—97 sec.	—44 sec.

Mean Rate of 89 Seconds.

Diagnosis—By this table it is evident that the horizontal position adjustments are relatively correct because of the variation of —1 second between dial up and dial down. The gain in the 12 up over the rest of the vertical positions, particularly that of 6 up leads us to believe that the inner terminal pinning point of the hairspring is also correct; the natural error being in the 6 up position.

The loss between the 9 up and 3 up positions may be due to one of or a combination of the following errors—excessive guard pin freedom, excessive endshake or sideshake in the escapement, improper depthing of roller jewel caused by escapement errors, poise error in balance. Prove inner terminal pinning point on hairspring.

Examination—Upon examination it was found that the inner terminal pinning of hairspring was correct, and overcoil properly formed.

The balance wheel was found to be out of poise, the heavy side being at the quarter or timing screw on the lower side of balance rim when in the 12 up position.

The escapement was checked for sideshake and endshake and examination showed excessive sideshake in the upper hole jewel of the escape fork.

Correction—The poise error was corrected. A new hole jewel of proper size for pivot was frictioned into the escape fork bridge, which corrected the sideshake in the escape fork bridge set up an error in the guard pin, causing it to come in contact with roller table. Guard pin was adjusted for correct freedom. Escapement was adjusted for lock, drop, and draw, and the guard, corner and curve tests applied and all found to be correct.

Watch was brought to time by manipulation of timing screws and run through a 24-hour period in each of the six positions. The position rates after corrections were made are as follows:

	Progressive Rate	Position Rate
Dial Up	+10 sec.	+10 sec.
Dial Down	+25 sec.	+15 sec.
12 Up	+38 sec.	+13 sec.
9 Up	+40 sec.	+ 2 sec.
3 Up	+38 sec.	— 2 sec.
6 Up	+31 sec.	— 7 sec.

Mean Rate of 22 Seconds.

The rate as shown by this table proves that the diagnosis was correct and the rate variation more uniform and consistent. By comparing rate charts we find the 9 up and 3 up position were corrected from an error of —51 and —31 to a +2 and —2. The 12 up and 6 up positions were also corrected from an error of +38 and —44 to a +13 and —7 seconds.

The variation in the (second chart) horizontal position of 5 seconds was corrected by the regulator pins. Another rate was taken in three positions to show the effect of the correction and adjustment of regulator pins.

	Progressive Rate	Position Rate
Dial Up	+ 4 sec.	+ 4 sec.
Dial Down	+ 7 sec.	+ 3 sec.
12 Up	+10 sec.	+ 3 sec.

Mean Rate in 3 positions, +1 Second.

The purpose of this article is to show

that errors can be pre-determined by a table of progressive and position rates. Other watches are now being adjusted along this same procedure and just as soon as they are completed the writer will publish his findings in subsequent issues.

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32.	Repairing Repeating Watches, by C. T. Etchells; E. Seibel, Conn.
33.	The Junior Watchmaker, by Thisell; A. G. Thisell, Ill.
34.	Modern Methods in Watch Adjusting, by Kelly; H. C. Kelly, Arizona.
35.	Watchmakers' Hand-Book, by Saunier; Horological Guild of Philadelphia, Penn.
36.	Electrical Horology, by Langman; Horological Guild of Philadelphia, Penn., and Herman Gruninger, Mich.
37.	Practical Balance and Hairspring Work, by Kleinlein; Kleinlein.
38.	Rules and Practice for Adjusting Watches, by Kleinlein; Kleinlein.

LANDAW BROTHERS
Watch Material and Jewelers' Supplies
406 Clark Building, Pittsburgh, Pa.

Martin Gluck and Son
SUPPLY SPECIALISTS TO THE TRADE
Clark Building Pittsburgh, Pa.

Oklahoma Activities

On November 12th the Oklahoma State Board of Directors held its annual meeting at Cushing Hotel, Cushing, Oklahoma. Mr. J. T. Mills, vice president (from Tulsa), presided. The following delegates attended: Wiley H. Adams, Geo. Usry and Carl Hurst of Oklahoma City; C. C. Heidinger of Sapulpa, Frank Trapp of Tulsa, and E. J. Tipton of Shawnee. Visitors were: N. C. McCoy, Cushing; Floyd Henson, Shawnee, and Sam Rigsby of Seminole. The new officers elected for 1940 were: President, C. C. Heidinger, Sapulpa; Vice President, F. D. Smith, Ada; Treasurer, Harold Cruse, Oklahoma City; Secretary, term unexpired. Plans for joint convention of jewelers and watchmakers were discussed, also licensing law and changes in by-laws.

The Canadian Valley Guild held election of officers on November 7th with the following results: President, Gus Ellwanger, Wewoka; Vice President, John Gladden, Holdenville; Treasurer, F. D. Smith, Ada; Secretary, Floyd Henson, Shawnee.

The Oklahoma City Guild held its election on November 23rd. The new officers are: President, Monte Thompson; Vice President, A. G. Vaughn; Secretary, Linley Lewis; Treasurer, Hugh McNutt. Meeting nights were changed for first and third Thursdays of each month. Mr. Wiley Adams, retiring president, was presented a billfold for his untiring efforts.

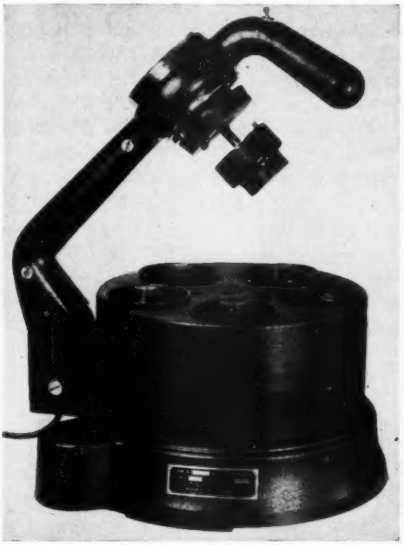
CARL D. HURST, *Sec.*

MID-CONTINENT JEWELER
"BEST FOR THE WEST"
Made especially for Jewelers and Watchmakers of the Central and Southwest Territory, which we have served for 36 years
Subscription $1.00 Per Year
MID-CONTINENT JEWELER
541 Dierks Building Kansas City, Mo.

Quintdrum Watch Cleaning Machine — Many Improvements

Semi-automatic, one hand operated throughout. Spring in the handle mounting holds the motor up. When operating the drum holds the motor down.

The drum has five compartments—hence its name Quintdrum. Has a hot air drying chamber; a cleaning compartment;



a compartment for spinning off surplus foam and a first and second rinse compartment.

In shape the compartments are one-fifth of a cylinder; metal throughout, all in one piece except the five lids and drain plugs (no glass).

The Boggs patented eccentric method is also incorporated in this machine, which insures the proper cleaning, without oxidization or discoloration. Simply run until watches are clean.

Cleaning fluids do not attack the drum. Fluid container is specially treated.

Due to the shape of the fluid container and to the flange, which constitutes the neck opening, extending down into the fluid container, no foam will raise up and come out of the container. This makes it unnecessary to use packings of any kind to retain the foam. Inasmuch as no packings are used, there is no give, it follows there is practically no vibration in spite of the fact that the basket is two and one-half inches inside diameter which allows a lot of weight to be off center.

The basket is taken off and also replaced with one hand. This basket will take 18-size watchcases and 8-day Walthams and Elgins, etc. The small parts are cleaned in a wire screen tray at the bottom, large parts in the top.

The makeup of the Quintdrum is such that a wide variety of finishes may be had, such as allover polished, crackle enamel, painted in various colors; with either sparkless motor, which allows the use of inflammable gases for rinse fluids, or may be equipped with a universal motor.

That Honor Roll

We start the membership Honor Roll so as to let each state see where they stand. The positions occupied will indicate paid 1940 membership standing.

Michigan, Kansas, Wisconsin, Virginia, New York, Arizona, Ohio, Missouri, Illinois, Iowa. The following are even for eleventh place: Colorado, Idaho, New York, Pennsylvania, Tennessee and Texas.

For twelfth place: Connecticut. All other states have not started, but watch the positions in February issue and help put your state on top.

New Officers

Syracuse Horological Guild—President, H. G. Harrington; Vice President, Walter F. Williams; Secretary, Fred C. Nhare; Treasurer, W. H. Miller.

YOURS FOR A SINGLE WORD

WATCHMASTER, watch rate recorder. Complete information, National Headquarters.

Try This on Your Senator

Connecticut has a law which prohibits the public display of a clock intentionally indicating anything but standard time, which is then described in the statute.

A jeweler had a street clock which showed other than the standard time. Because of this he was liable to a fine of $100.00. The jeweler was convicted because the court said that the statute was right . . . that it was in the interest of public safety, morals, and welfare.

Announces New 15-Jewel Elgins at $24.75

Special Advertising in February to Spread News of Exceptional Elgin Values

During the month of February, the Elgin National Watch Company is launching a special advertising campaign to offer the public a new line of 15-jewel, "America-First" watches at an unusually low price. The watches, according to the recent announcement made by T. Albert Potter, president of the company, are values such as Elgin has never offered at retail before at less than $29.75, yet they are to sell at $24.75. They are completely new merchandise and each watch for the first time at $24.75 is equipped with the patented Elginium hairspring and Beryl-X balance—with patented grooved staff, all exclusive features developed in the Elgin watch laboratories. The new Elgin hairspring and balance are, according to Elgin officials, absolutely rustproof, nonmagnetic and unaffected by climatic and temperature changes.

The copy of the February campaign tells about the fine workmanship in the new 15-jewel watches, their smart styling, and emphasizes the fact while they would be excellent values at $29.75 they are to sell for $24.75. Mr. Potter together with Howard D. Schaeffer, vice-president in charge of Elgin sales, first announced the advertising campaign to wholesale jewelers through a national telephone hook-up just before Christmas. Pointing out the success of Elgin's 75th Anniversary promotion last year and the better all-around business conditions, the Elgin officials voiced confidence that the new promotion would yield an even better volume to wholesale and retail jewelers.

Papers and magazines with a combined circulation of more than 14,000,000 have been selected to launch the February campaign. More than 5,500,000 full-page, 2-color selling messages will appear in magazines. The first magazine arvertisement comes out in *The Saturday Evening Post,* issue of February 10th; the second in Collier's for February 24th. Twenty-five leading newspapers, covering America's largest metropolitan areas will carry 8,500,000 big-space ads about the values in the Elgin "America-First" offer.

The Elgin February campaign also includes special tie-in materials for retailers such as newspaper mats, window streamers, display cards and special sales letters.

Use Fulcrum Oils This Year

The most competent horological technicians say that Fulcrum Oils are the only PERFECT Lubricants for Watches and Clocks. If you are not using Fulcrum Oils, try them and prove this statement.

Any Material Jobber Will Supply You

Fulcrum Oil Co. **Franklin, Pa.**

Selecting the Best

By JOHN KRUSE,
U. H. A. A. Technical Board

LEARNING to be a watchmaker and teaching a youngster to become a watchmaker are two tasks which are impossible to accomplish unless both student and instructor have a natural liking for the subject.

This is our experience in the past twenty-two years, during which time we have taught some twenty-five students of sixteen years and older, and have put them into the field of the watch repairing industry with splendid results. Some of these boys have advanced to executive positions while all the others are now capable, competent mechanics in the watch repairing trade. More first-class practical mechanics of this kind are wanted all over the United States.

In 1917, I started a trade watch repair shop, but very soon came to the conclusion that this was not a one-man job. I then associated with a most brilliant watch mechanic as a partner and we operated a business under the name of Kruse & Little.

Almost immediately we saw the possibility of fulfilling two purposes. First, to help to fulfill the dream of a youngster's ambition to become a watchmaker, and second, to fill a vacancy in our shop for which we could not pay a high salary. We took in a boy to act as an office and errand boy and we also intended to teach him our trade in his spare time.

We began by teaching him to take down watch movements and to clean the parts, and by special instruction, we taught him to locate major defects on the various parts. He did this for several weeks and in between time he practiced on lathe work. Soon the boy had proven to us that it was possible for us to give him full training in our industry, and at the same time, he could run errands and do small tasks about the office.

It was not long before the boy was able to find almost any visible defect on the watch parts which he cleaned and the next step he learned was to assemble watch movements. This did not take him long and he then received lessons on balance wheel and hairspring work. This work, together with his previous lessons, took quite a few weeks, after which time we gave him the lessons on escapements.

In my experience, the proper adjustment of escapements is one of the most important factors in watch repairing. For this reason we chose a time for instruction when the student would not be interfered with nor distracted. This was a few hours after regular working hours, and as our shop was located on the sixth floor of an office building, one could hear a pin drop in the next room after 5 o'clock.

I explained the working of escapements to the boy and allowed him to make alerations. After three hours of intense study, he convinced me that he understood the principle of escapements by making proper adjustments on several faulty escapements which I had prepared for him, and since those hours of study, this boy was no more a student to me but was, rather, a helper and assistant. A few months after this period there was no ordinary watch which this young man could not put in satisfactory condition.

I must confess, however, that approximately seventy-five per cent of the youngsters who tried to learn to be watchmakers did not have the necessary qualifications to become mechanics, and in most cases we then discouraged them from continuing to waste more time in attempting to become satisfactory watch mechanics as these boys were better fitted for some other occupation.

At some future time, I would like to explain the outstanding faults and weak points of students, which will hamper them to quite an extent, from becoming successful watchmakers.

Resolve to keep happy, and your joy and you shall form an invincible host against difficulties.—Helen Keller.

Sioux City Horological Guild

Under the chairmanship of Mr. P. Berglund, the guild will hold a rousing meeting January 8th, at which time their main speaker will be Senator Forsling. Other speakers of prominence will be present to talk on the subject of state legislation and other issues.

Ladies will be invited.

There will be music by a five-piece orchestra, also motion pictures, and other interesting subjects. All within a radius of 100 miles or better should attend this meeting and enjoy the hospitality of the Sioux City Horological Guild.

Tulsa Guild

Tulsa Guild will hold their next meeting January 2nd, at which time there will be held the selection of officers as well as our usual technical program. On November 18th, Tulsa guild held their dance party at the local Country Club. The affair was a huge success both in numbers and financially. Over 125 attended, all enjoying the dance and party, as well as 32 gallons of beer.

Out-of-town visitors were Mr. and Mrs. Carl Hurst, and Mr. and Mrs. Hugh McNutt of Oklahoma City.

GEORGE J. SLOAN, *Pres.*

Southwestern Minnesota Watchmakers Guild

A meeting of the Southwestern Minnesota Watchmakers Guild was held at Redwood Fall, Minn., on Sunday, December 3rd. A large number of jewelers attended the meeting, at which officers for 1940 were elected. A. B. Petersen of Windom was elected President; Harry Rolph of Westbrook, Secretary, and James Marcotte of Marshall was appointed Publicity Director.

The program planned for the coming year was to increase membership and to make the work and plans of the guild more widely known through publicity in local newspapers and all trade journals.

JAMES O. MARCOTTE, *Publicity.*

Student Guild No. 1

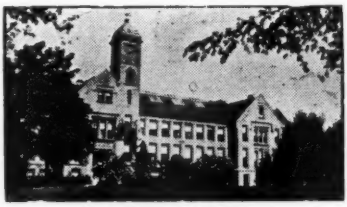
November 30, 1939, the New York State Student Watchmakers Guild No. 1 initiated 7 new members into the guild. These new members constitute the freshman class in the Horological Dept. at the New York State School of Agriculture at Morrisville, N. Y. It is not compulsory to join, yet all freshmen did become members, which we are proud of.

Before the initiating started, each freshman was given a piece of pegwood to break, which was easily done. Then, a bundle of pegwood was passed around and each applicant tried to break the bundle. He found it much harder to do. The point brought out was the fact that a single piece or person has little strength while several pieces or persons 'banded together' can exert great strength and power. With this in mind the freshmen were initiated into the guild.

As an informal initiating ceremony the freshmen were paraded around the school campus on a donkey. After several informal tricks, they were brought into the Guild Hall on the donkey, initiated

Patronize Our Advertisers

"The Pathway to Success"



WATCHWORK
JEWELRY
STONE SETTING
ENGRAVING

Bradley Polytechnic Institute
School of Horology

DEPT. B PEORIA, ILL.

Established 1886

formally into the guild, thus becoming full pledged members of the guild.

New Students Initiated.

The Student Guild now has 15 members. With this greater number, we are planning more activities along various talks and the entertainment line. We are represented in about all parts of the state. When the students graduate the guild situation will be carried around the state.

Florida

The state of Florida is putting on their first "feeler" drive and making splendid progress. Shortly, four new guilds will have been created in various sections of the state. Watch the activity in Florida from now on!

The Horological Society of New York, Inc.

The New York Horological Society held its December meeting on December 7th at their regular meeting rooms at 150 West 85th Street, in New York City, before a large assemblage of members and guests.

Mr. Andrew Park, president, announced that an extensive program has been arranged for the Annual Banquet to be held on Sunday evening, February 11, 1940, at the St. Moritz Hotel in New York City.

Mr. Park invited members and their friends to the next meeting in January when refreshments will be served.

The entertainment portion of the evening was the showing of sound moving pictures of scientific nature which was followed by films of a lighter variety.

The executive meeting of officers of the New York Horological Society took place on Monday evening, December 11th, at the St. Moritz, in New York City. It was decided, by this group, because of the proximity of the scheduled meeting to the New Year's holiday to postpone the January meeting to Wednesday, January 10, 1940.

Toledo Guild

Held its last meeting for the year 1939 on November 10th, and elected new officers for the coming year. Those elected were: J. S. Postley, President; Mr. Orville Holder, Vice President; Charles Vuille, Secretary and Treasurer; Leo E. Kopf, Trustee, and S. F. Weaver, Trustee.

The assembly voted on a twenty-five cent increase in dues for the benefit of the National Library.

GEORGE CORDES, *Sec.*

HAMILTON CRIPPLES INDUSTRIAL CATALOGS IN DECISIVE COURT TRIAL

A strong and decisive blow was struck at the so-called Industrial Wholesalers, on November 13, when Justice Lloyd Church of the New York State Supreme Court released his conclusions in the case of Hamilton Watch Company versus Caroline R. Macher, doing business as the Wholesale Watch & Jewelry Company of New York City, and her husband Robert J. Macher.

For years Hamilton has made every legal effort to eliminate violators of the Fair Trade Acts who have been disrupting Eastern jewelry markets. The ultimate successful conclusions of this case is hailed with joy by manufacturers and retailers alike, for the decision establishes a precedent which becomes a death blow to all so-called wholesalers offering nationally advertised merchandise at less than advertised retail prices.

All evidence pointed to the fact that Macher's operations were designed with intent to make the public believe it was trading with a wholesale house. Throughout the trial it was evident that the Wholesale Watch & Jewelry Company thinly disguised its trade practices to keep within the letter of the law while actually flaunting it openly.

Macher has annually distributed hundreds of thousands of catalogs and advertisements in New York, New Jersey and Connecticut, purporting to come from a wholesaler of the merchandise illustrated, and offering said merchandise at prices well below the accepted retail value. This point was covered in a recent ruling by tht Federal Trade Commission, which sought to eliminate the false impression by demanding the removal of the word "wholesale" from the company name. In view of Mr. Justice Church's findings the Macher interests must cease immediately all inference that they are wholesalers or jobbers—since

Justice Church has found that Hamilton Watch Co. is entitled to judgment enjoining Caroline R. Macher or Robert J. Macher "from issuing any more misleading advertising which purports to hold out to the public that they, the defendants, are wholesalers or jobbers or that the articles covered by the Fair Trade Act of the City of New York may be purchased from the defendants at less than the full resale price thereof."

It was brought out during the trial that prospective purchasers of Hamilton watches could secure 30% discount by presenting a trade-in watch of little or no commercial value. Those not possessing such a watch were directed to an adjoining floor where one could be secured for twenty-five or thirty-five cents. This practice was found by the court to be "a subterfuge for the purpose of escaping the provisions of the Fair Trade Law," and therefore illegal.

Since the New York Fair Trade Act permits the sale of "closeouts" at a discount, the Wholesale Watch & Jewelry Company sought to take advantage of the letter of the law by illustrating 9 Hamilton watches purporting to be closeouts of Hamilton's commodity when such was not actually the case. The conclusion of the court enjoined the defendants "from picking out certain models of the plaintiff's commodity and selling them as 'closeouts' unless and until the defendants . . . wishes to sell out the entire commodity" known as Hamilton watches, and forever thereafter refrain from offering or selling them.

The costs of the case were placed on the defendant.

Hamilton Gives Bonus to All Employees

Shareholders Get $6 on Preferred, $1.25 on Common

Lancaster, Pa.—Employees of the Hamilton Watch Company received a bonus today in the form of a full week's wages.

It was announced also that Hamilton stockholders will receive $1.50 a share on Preferred this month making the year's total $6 a share. And 50 cents a share on Common, bringing that total to $1.25 per share for the year.

Hamilton Watch Employees Spread Christmas Spirit Afar at Carol-Sing

President Kendig Speaks

Following a custom adopted many years ago, the Hamilton Watch Company celebrated Christmas on the eve of their annual holiday by gathering all the employees together for a carol-sing.

Led by a choir and brass quartet organized and directed by three fellow-employees, the whole Hamilton organization joined in singing a varied program of well-known Christmas songs.

During the program, which was broadcast widely from Lancaster, Pa., President Kendig made a brief and inspiring address.

In part, Mr. Kendig said: "Fellow employees of Hamilton Watch Company, those who are privileged with health and are present, those who are confined to their homes and friends listening in. In behalf of the board of directors and my associate officers, I extend to each one of you and your families a cordial Christmas greeting.

"Speaking to a group who are constantly thinking in minutes and seconds it is interesting to note that approximately one billion minutes have passed since the birth of Christ, in whose honor we gather today.

"When we look at the map of the world and observe how many of its people are at war, we realize this world has wandered far from the principles laid down by Jesus Christ. But surely this principle of living continues to actuate the lives of Christian men and women in the home, the factory and community."

Elgin National Watch Company

Recently announced at a directors' meeting the amounts of its dividends and its contributions to major employee services for 1939.

For the year just finished, the company's dividends totaled $800,000. This amount is considerably higher than the dividend for 1938 which stood at $500,000.

Longines-Wittnauer Watch Co. Gives Christmas Bonus to Employees

Mr. Edward Detjen, vice-president of the Longines-Wittnauer Watch Co., Inc., 580 Fifth Avenue, New York, New York, announced today that a special Christmas bonus to employees is being paid this week. Every employee of the company will receive a minimum of one full week's

salary with some larger and special bonuses to be paid for special considerations.

ELGIN ENJOINS USE OF ITS NAME

Elgin National Watch Company, in accordance with its policy of affording retailers the greatest possible assistance in selling its products by maintaining, unimpaired, its reputation as a manufacturer of quality merchandise, instituted in August of 1938 in the United States District Court at Chicago a suit against Elgin Razor Corporation, Elgin Laboratories, Inc., and the owner of them, for an injunction restraining them from using the name "Elgin" as a trade mark or brand name on electric razors, cameras and cigar lighters and in their corporate names. This action was taken as soon as it became apparent that the public was being led to believe that the razors, cameras and cigar lighters were manufactured and sold by Elgin National Watch Company.

In December, 1938, the Court issued a preliminary injunction requiring the defendants to distinguish their products from those of the plaintiff by using, in type of the same size and style, in connection with the word "Elgin," whenever and wherever it appeared, the following statement: "Not connected with Elgin National Watch Company."

Last November the Court entered a decree finding that the name "Elgin" has come to mean and is now understood by the trade and the public to mean the plaintiff and plaintiff's products only; that the defendants were using in interstate commerce the name "Elgin" as a brand name for electric razors, cameras and cigar lighters and the corporate names Elgin Razor Corporation and Elgin Laboratories, Inc.; and that they were thereby infringing the registered trade mark of the plaintiff. This decree permanently enjoins the defendants, their agents and successors, from using the name "Elgin" as a trade mark or brand name for electric razors, cameras and cigar lighters or any other goods of substantially the same descriptive properties as plaintiff's products, and from using the name "Elgin" in the corporate names of Elgin Razor Corporation and Elgin Laboratories, Inc., or in any other corporate name or business style. The defendants were also required to assign to Elgin National Watch Company all registrations they have taken out on the name "Elgin."

LONGINES-WITTNAUER WATCH CO. GETS INJUNCTION AGAINST PRICE-CUTTER

Court Issues Permanent Injunction Against Albert Panitch and Modern Watch Company of Chicago

A permanent injunction against Albert Panitch trading as the Modern Watch Co. of Chicago restraining them from advertising, offering for sale, or selling Longines watches at less than authorized prices was granted by the Hon. Robert J. Dunne of the Circuit Court of Illinois in an action brought by the Longines-Wittnauer Watch Company, Inc., under the Illinois Fair Trade Act.

The Modern Watch Co., though not an authorized Longines-Wittnauer Agency, had sold a Longines watch in violation of the Illinois Fair Trade Act which stipulates that a dealer is bound by the manufacturer's authorized fair trade prices.

This action by the Longines-Wittnauer Co. was undertaken by the complainant to give every support to legitimate jewelers by insuring the enforcement of the manufacturer's authorized prices under the provisions of the Illinois Fair Trade Act.

Famous "Voice of Time" Reviews Making of Hamilton Time

Westbrook Van Voorhis, the man who has boomed out the well-known phrase "TIME MARCHES ON" at least 20,000 times during the last 9 years, viewed an important phase of America's "history in the making" recently when he toured the Hamilton Watch factory at Lancaster, Pa.

Ever on the move to see the wonders of the world of today, Mr. Van Voorhis was highly intrigued by the efficient manufacturing processes now used to produce the nation's world-renowned "watch of railroad accuracy."

H. I. A.

The Examining Board of the Horological Institute of America met in Washington, D. C., on November 25, 1939, and granted certificates to the following watchmakers who successfully passed the examinations of the Institute.

Certified Watchmaker

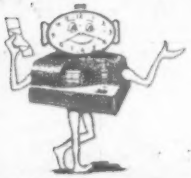
Name	Address	Employed by
Bruce L. Badley,	Lander, Wyo.	Self
Charles O. Goodrich,	Portsmouth, Va.	R. W. Chapman
Paul J. Hendricks,	Clovis, N. M.	May Bros.
William C. Holub,	Hudson, Iowa	Charles Tenenbaum
J. W. McCary,	Shreveport, La.	E. M. Venable
Richard H. Milhone,	Canton, Ill.	Self
Robert W. Mintmier,	Peoria, Ill.	Student at Bradley Institute

Junior Watchmaker

Donald S. Aitken,	Carbondale, Pa.	Birkett, Jeweler
John T. Baker,	Peoria, Ill.	Student at Bradley Institute
Alfred J. Berger,	Houston, Texas	O. P. Sellingslot
Willie Edwin Jenkins,	Charlottesville, Va.	Keller & George
Ralph Pertcheck,	Toledo, Ohio	Peoples Jewelry Co.
Harold H. Riedel,	Peoria, Ill.	Student at Bradley Institute
Clarence J. Tinetti,	Peoria, Ill.	Student at Bradley Institute
Gerald E. Trump,	Peoria, Ill.	Student at Bradley Institute
Joseph A. Wenzl,	Elgin, Ill.	Student at Elgin Watchmakers College
Robert B. Whelan,	Peoria, Ill.	Student at Bradley Insittute

Repaired watches for grading at the January, 1940, meeting of the Board should be in for test by January 1, 1940.

R. E. GOULD, Secretary.



Robert Van C. Davies of Summit, N. J., uses a chart record printed by the customer's watch on a WatchMaster to explain why the watch has a varying rate in different positions.

When the watch is repaired, Mr. Davies will return it with a printed proof of accuracy.

Watch Master **Proof of Profits**

IN 30 SECONDS

the WatchMaster produces printed record of the rate of any watch in any position, and indicates the cause of irregularity.

"A few years ago, I started to do watch-repairing at home, hoping to open a store of my own in two years. I bought a WatchMaster. Through its speed and consequent economies, increasing profits helped me to open my store after two months. Within six months I required three watchmakers to handle the volume of work. How can I better tell you what the WatchMaster means to us?

Cordially,
ROBERT VAN C. DAVIES,
Summit, N. J."

WRITE FOR BOOK OF SPECIMEN CHARTS

American Time Products, Inc.

580 Fifth Avenue, New York

Distributor Western Electric Watch Rate Recorders

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S,
J."